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Procedia Social and Behavioral Sciences 2 (2010) 2181–2184

Procedia
Social and Behavioral Sciences

WCES-2010

Evaluation of two type of collaborative activities in the subject Zootecnia I

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Received October 19, 2009; revised December 28, 2009; accepted January 11, 2010

Abstract

The aim of this work has been to analyze the results obtained in two types of collaborative works proposed to the students of the four groups (G). In the first work (W1) students chose freely a scientist-technical topic (G1 and G2). In the second option (W2) a scientist paper published in a SCI journal (G3 and G4). The average mark for W2 was higher than for W1 option (8.2 *vs.* 7.0, $P < 0.05$, respectively). However, the average mark of the mid-term examination and of the question formulated in this test in relation with the collaborative activity was lower for workgroups of W2 option compared to those of W1 (6.5 *vs.* 8.0 and 1.5 *vs.* 8.6, respectively, $P < 0.05$). In conclusion, it is necessary to assess in the exam the learning reached with the execution of the works. However, the type of question formulated determines this assessment.

Keywords: collaborative activity; continous evaluation; b-learning; transversal competences.

1. Introduction

The adaptation toward the European Higher Education Area (EHEA) leads to the need of transforming the teaching-learning methodologies used in the traditional university teaching. Now, with the use of innovative teaching techniques, learners must develop some transversal competences to achieve learning outcomes (Tuning, 2003). Among others, these stand out: cognitive abilities (high capacity to increase and deepen their knowledge), linguistics skills (capacity to use technical and scientist language fluently, orally and written), technologic skills (capacity to search and choose the bibliography more suitable) and interpersonal competences (capacity to develop a collaborative work by committed way). In this context, the collaborative learning demands to students working together to achieve shared objectives. An interaction among all the members of group must exist, so that, each one must contribute similarly to the final work. This effort must be assessed by the teacher and by partners within the group (Bará & Domingo, 2006). The assessment system must also be adapted to the new methodological strategies and objectives in order to allow us to evaluate the results of the teaching-learning process (Benito, 2005). In the course 2008-2009 it was proposed two types of collaborative activities for continuous evaluation to the students of

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doi:10.1016/j.sbspro.2010.03.303

the mandatory subject Zootecnia I (reproduction module) to improve their transversal competences. In the first work students could choose freely a scientist-technical topic related with this module. In the second option a scientist paper published in a SCI journal was assigned to each workgroup. Both types of work had to be presented orally to all the students coursing the subject. The aims of this paper are analyzed: i) the results obtained in the two collaborative works, ii) the average marks obtained in each type of work and in the mid-term exam of continuous assessment, iii) the correlation of the marks of the exam respect to the question of the work in the test and iv) the opinion of the learners over the carrying out of the collaborative activities.

2. Methodology

Zootecnia I is a mandatory course of second cycle to obtain the MSc in Agricultural Engineering in the Universidad Politécnica de Madrid. The course has been taught to the students in first four-month term of the fourth academic year, allocated in four groups (G1, G2, G3, G4). It was composed by two modules: Animal Reproduction and Nutrition. Each subject is assessed independently, as a result of the mid-term examination and the continuous work performed by the students according to the expression: 0,70 x mid-term examination + 0,10 x collaborative activity + 0,10 x onsite exercises + 0,05 x self-assessment questions + 0,05 x practices. The Moodle platform was used, as support to the lecturers and as a blended learning strategy that combines classroom teaching with electronic exercise work. The mid-term examination of each subject, the self-assessment questions of each topic and the practices were carried out using this platform. In the practices of the reproduction subject the students see two videos related with the list of topics. Afterwards, they had to answer an *on line* test related with the contents of these videos.

In the Reproduction module it was also proposed two types of collaborative works to the students of the four groups (5 students maximum in each workgroup, 9 workgroups/group). The fellow team members were formed freely by students. In the first work (W1) students could choose freely a scientist-technical topic (in Spanish language) related with this subject (G1 and G2). In the second option (W2) a scientist paper published in a SCI journal (in English language) was assigned to each workgroup (G3 and G4). All the students of the workgroups had to do an oral presentation of their work for 15 minutes. Previously they had access in the Moodle platform to the detailed instructions about how they had to carry out the written document, the oral presentation and the assessment procedure. All the works had to be available in the platform in a fixed date to be available for all the students to their reading.

A survey was carried out to evaluate the opinion of the students about the collaborative activities. They had to answer different questions scoring from 1 up to 5 (1: nothing in agreement; 5: totally in agreement).

3. Collaborative activity assessment

The written format (2%), the work organisation (2%), the scientist and technical level of their contents (3%) and the presentation and oral exposition (3%) were scored in the evaluation process (total 10%) of the two collaborative activities. The questions answered by each student and their participation with questions at the others workgroups were also valuated. Besides of the teacher evaluation, each member of the group assessed their own effort within of the group and those carried out by the others partners of his workgroup.

When the reproduction module was finished a mid-term examination was performed in Moodle platform to asses the learning outcomes. In the exam a total of twenty questions were formulated. Nineteen of them were of multiple choosing, to pair off, numerical calculation and one word response. The other one was related to the collaborative activities purposed and it was of the type true/false for W1 or multiple options for W2.

4. Results of the collaborative activity

The number of students that made the mid-term examination in G1, G2, G3, y G4 was 48, 41, 41 and 31, respectively. In Table 1 are shown the results obtained by students that carried out the continuous assessment. The percentage of students that made the collaborative work (over the total of students that followed the continuous evaluation) was similar in groups G1, G2 and G4 (95.8%, on average), but it was lower (87.5%, $P < 0.05$) for G3. This lower participation of the students of G3 probably reflected a lesser interest, as the average mark of the

collaborative works W2 in this group was lower than in G4 (8.6 *vs.* 7.9). The same effect was observed in the average mark of the question in relation with the reproduction work, as in students that made the collaborative activity (0.9 *vs.* 2.0) as in those did not make it (2.0 *vs.* 7.6). The average mark of the collaborative works W1 was lightly lower in G2 with respect G1 (6.7 *vs.* 7.3). On the contrary, the average mark of the mid-term examination was higher in G2 than in G1 (8.4 *vs.* 7.5), probably because they devoted more time to study the exam to compensate the lower mark in the collaborative activity. On the other hand, in the students of G1 and G2 the average mark obtained in the question of the exam in relation with the reproduction work was higher in those that previously had carried out the activity (G1: 8.0 *vs*. 7.4 and G2: 9.2 *vs.* 8.4), whereas G3and G4 showed the contrary trend (G3: 0.9 *vs.* 2.0 and G4: 2.0 *vs*. 7.6). Probably, in G3 and G4 the students prepared better the work to compensate the null calcification and pass the subject by continuous evaluation.

The average mark for W2 option was higher than for W1 (8.2 *vs.* 7.0, $P < 0.05$, respectively). However, the average mark of the mid-term examination and of the question formulated in this test in relation with the collaborative activity was lower for W2 option compared to W1 (on average 6.5 *vs.* 8.0 and 1.5 *vs.* 8.6, respectively, $P < 0.05$). The lower mark obtained in the mid-term examination might be due to a shorter time of students of the W2 option to prepare the exam, because they already had a higher mark in the activities programmed in the continuous evaluation to pass the course. Whit respect to the lower score obtained in the question in relation with the collaborative works, the type of question formulated in the test might have also influenced the results obtained (type true/false for W1 or multiple options for W2). In a previous work, Villamide *et al.* (2006) found that multiple choice questions included *on line* resulted to be the best to evaluate the knowledge of a subject because their difficulty index were around 52%, whereas in single choice questions were only 30%. Besides, in the true/false answers the probability to have a correct answer by random is higher than in multiple option. In Moodle it is not possible to deduct the random effect because negative scoring is not allowed in true/false answers, whereas it is possible to do it in multiple choosing answers. These types of questions were scored counting the proportional part of percentage of the correct answers, but deducting the wrong answers (Nicodemus *et al.,* 2007). As a consequence, only a positive correlation ($r = 0.36$; $P < 0.001$) was found between the average mark of the exam and of the question formulated in relation with the work W2.

Table 1. Monitoring of the students that carried out continuous evaluation

Groups	**G1**	**G2**	**G3**	**G4**
Collaborative activities	**W1**	**W1**	**W2**	**W2**
% students that carried out the collaborative works [1]	95.8	95.1	87.5	96.5
Average mark of the collaborative works	7.3±1.4	6.7±1.6	7.9±1.1	8.6±0.7
Average mark of the mid-term examination[2]	7.5±1.0	8.4±0.8	6.5±1.3	6.5±0.8
Average mark of the question in relation with collaborative works[2]	8.0±4.0	9.2±2.8	0.9±1.8	2.0±1.9
Average mark of the question in relation with collaborative works[3]	7.4±1.2	8.4±0.85	2.0±3.3	7.6±0.0
Correlation between the mark of the mid-term examination and the mark of the question in relation with the collaborative works in the exam	0.25	0.03	0.37	0.35

1 Over the total of students that followed continuous assessment.

2 Of the students that carried out the collaborative work.

3 Of the students that did not carry out the collaborative work.

5. Student valuation about the collaborative activities

The students were more interested in to increase the score in this subject (W1: 4.09 and W2: 4.38; Table 2) than in to increase the learning outcome (W1: 4.06 and W2: 3.45). These results are in agreement with a previous work performed by Alvir *et al.* (2007. However, the skills reached by them have been positives, enhancing the utility of the work to apply the theoretical knowledge of the subject in the practice (W1: 3.97 and W2: 3.58) and the

development of their synthesis and analysis capacities (W1: 3.63 and W2: 3.5). The oral communication has been well valuated (W1: 3.78 and W2: 3.80), although they have felt uncomfortable with the exposition of the work in the presence of the others students (W1: 3.25 and W2: 3.56). They have not found difficulty to establish the order and structure of the work (W1: 3.94 and W2: 3.59) and to organize it (W1: 3.78 and W2: 3.54). The higher differences between the two types of activities have been found to synthesize the information of the work (W1: 3.25 and W2: 2.51), probably due to the works assigned to students of W2 were written in English language. The assessment by the students of the global learning outcome has been positive (W1: 3.72 and W2: 3.52). In general, the score of the collaborative works were lowest by the students assigned to W2. This result could due to the fact that in this activity was included the students of G3, whose interest by the subject were lower.

Table 2. Results of the survey performed to the students that carried out collaborative activities

Groups **Collaborative activities**	**G1-G2** **W1**	**G3-G4** **W2**
The work has been realized to improve learning about this subject.	4.06	3.45
The work has been realized to reach better score in this subject.	4.09	4.38
The work has been useful to put in practice the theoretical knowledge of this subject.	3.97	3.58
The work helped me to develop my synthesis and analysis capacities of the contents.	3.63	3.50
The work has been useful to develop my written communication capacity.	3.41	3.13
The work has been useful to develop my oral communication capacity.	3.78	3.80
The organization of the work has been easy.	3.78	3.54
To establish the order and structure of the work has been easy.	3.94	3.59
It has been easy synthesize the information of the work.	3.25	2.51
It has been easy to choose the best significant of the work to prepare the oral presentation.	3.63	3.07
I have not felt uncomfortable exposing the work in the presence of others students.	3.25	3.56
With the evaluation of the work the critic and auto-critic capacities were fomented.	3.63	3.23
To assess the global learning outcome that you have reached doing these works.	3.72	3.52

Questions scored from 1 up to 5 (1: nothing in agreement; 5: totally in agreement).

6. Conclusions

In conclusion, it is necessary to assess in the exam the learning reached with the execution of the works. However, the type of question formulated determines this assessment. We considered that true/false question was not enough discriminatory in this type of control.

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